



March 3, 2006

**RECEIVED**

*By loppjectop at 8:54 am, May 16, 2006*

Mr. Don Hwang  
Alameda County Environmental Health (ACEH)  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502

**Re: Work Plan for On-Site Investigation  
ARCO Service Station #0601  
712 Lewelling Boulevard  
San Leandro, California  
ACEH Case No. 4275**

Dear Mr. Hwang:

At the request of Atlantic Richfield Company (ARCO), Remediation Management (RM), a BP-affiliated company, URS Corporation (URS) is pleased to submit this *Work Plan for On-Site Investigation* for ARCO Service Station #0601, located at 712 Lewelling Boulevard in San Leandro, California (the Site, Figures 1 and 2). This *Work Plan for On-Site Investigation* has been designed to delineate deep contamination on the southeastern portion of the Site.

## **1.0 SITE BACKGROUND**

The background information and previous work conducted on- and off-Site was furnished to URS by RM. URS has relied on the information provided to prepare this document and is neither responsible for, nor has confirmed the accuracy of the information contained in the documents reviewed.

### **1.1 Site Description**

The Site is located at 712 Lewelling Boulevard in San Leandro, California (Figures 1 and 2) and is an active ARCO gasoline service station. The Site is bound by Lewelling Boulevard to the northwest, Washington Avenue to the northeast, residential units to the southeast, and a commercial parking lot to the southwest. The majority of the Site is concrete and asphalt paved.

Current Site structures include four 10,000-gallon underground storage tanks (USTs), two fuel dispenser islands with a total of eight dispensers, and a convenience store building with two unused vehicle service bays.

## 1.2 Previous Work

According to an *Additional Offsite Subsurface Investigation Aquifer Pumping Test and Remedial Alternatives Feasibility Study*, prepared by RESNA Industries Inc. (RESNA, 1993), two 6,000-gallon and two 4,000-gallon single-walled steel product USTs and one 280-gallon waste oil UST were excavated and removed from the Site by Gettler-Ryan Inc. of Hayward, California during January 1990. Investigations performed by Applied GeoSystems (AGS) prior to removal of these USTs revealed petroleum hydrocarbons on the north and east sides of the product USTs and in the vicinity of the waste oil UST.

In February 1990, four double-walled steel clad 10,000-gallon USTs were installed at the Site.

In December 1990, AGS converted three soil borings to groundwater monitoring wells (MW-1 through MW-3).

Product removal at the Site began in August 1991.

In October 1991, RESNA advanced six soil borings, converted five soil borings to groundwater monitoring wells (MW-4 through MW-8), and performed a vapor extraction test. Vapor extraction was deemed not feasible due to high groundwater elevation (average of approximately eight feet below ground surface) at the Site.

In October 1991, a well survey revealed a total of sixty-nine wells within a half-mile radius of the Site; two domestic wells (up-gradient), one cathodic protection well (half-mile east of Site), twenty-seven monitoring wells (majority up-gradient), thirty-two irrigation wells (west and northwest of Site), four test wells (three located north and one located one-third mile south), two abandoned wells, and one well with an unidentified use (northeast).

In March 1992, RESNA submitted an addendum to a *Work Plan for Interim Groundwater Remediation*, proposing a groundwater extraction and treatment (GWET) system.

In October 1992, RESNA advanced nine off-Site soil borings, and converted four of these borings to groundwater monitoring wells (MW-11 through MW-14).

In December 1992, the California Regional Water Quality Control Board (CRWQCB) issued Cleanup and Abatement Order No. 92-147 (CAO 92-147) to ARCO Products Company (ARCO) and John J. Sullivan. This order required an access agreement be made between ARCO and Mr. Sullivan for the purpose of additional investigation of groundwater and soil, or for Mr. Sullivan to submit a work plan to conduct the investigation himself.

In March 1993, one off-Site down-gradient groundwater monitoring well (MW-15) was installed.

In August 1993, RESNA advanced four soil borings and converted three of these soil boring to groundwater monitoring wells (MW-9, MW-10, and MW-18). Two of these wells (MW-9 and MW-10) were installed on Mr. Sullivan's property, as original requested in CAO 92-147. RESNA also performed a step drawdown aquifer test on wells MW-8 and MW-12 at that time,

which indicated that pump and treat remediation would not be feasible due to numerous discrete water bearing sand zones. RESNA submitted their *Remedial Action Plan* at this time, which most notably stated that the shallowest groundwater in the area was not of beneficial use due to local and regional impact by contaminants including arsenic, iron, manganese, tetrachloroethylene (PCE), trichloroethylene (TCE), and sewage.

In February 1997, EMCON Associates of San Jose (EMCON) conducted vapor testing at the Site near identified receptor locations in preparation for *Risk-Based Corrective Action* (RBCA) report. Low concentrations of benzene were detected; however, the levels identified during this investigation required no further evaluation for potential sensitive receptor pathways.

In June 1997, EMCON prepared a *RBCA, Tier I and Tier II*, for the Site. EMCON concluded that the impact at the Site did not represent a hazard to human health (on-Site commercial or off-Site residential), that no further remedial action was necessary, and that all possible migration pathways had been investigated or were being investigated.

In July 2002, Delta Environmental Consultants, Inc. (Delta) conducted PG&E utility trench hand borings, as reported in a *Hand Auger Boring Installation Report* (Delta, 2002). Delta concluded that migration of contaminants had been occurring in utility trenches. High levels of total petroleum hydrocarbons as gasoline (TPH-g); benzene, toluene, ethylbenzene, and total xylenes (BTEX) were detected. Methyl tert-Butyl ether (MTBE) was not detected.

In June 2003, URS supervised the removal, disposal, and replacement of all product lines and dispensers, as reported in a *Dispenser and Product Line Removal and Upgrade Soil Sampling Report* (URS, 2003). A total of approximately 21,000 gallons of groundwater was extracted during these activities.

In 2004, an oxygen release compound (ORC) was installed in wells MW-2, MW-3, MW-5, and MW-8.

Quarterly groundwater monitoring at the Site was initiated in June 1990 by RESNA, was performed by EMCON for an unknown period of time, and is currently performed by URS.

### 1.3 Site Geology and Hydrogeology

The Site is situated within the East Bay Plain, located in the west-central portion of the San Leandro Cone (Hickenbottom and Muir, 1988). Helley *et. al.* (1979), mapped the subsurface material underlying the Site area as Quaternary bay mud deposits composed primarily of dark plastic clays and silty clay rich in organic material.

Based on interpretations made in RESNA, 1993, the shallow local water-bearing zone consists of one to three thin ( $\frac{1}{2}$  to 5 feet thick) sand to clayey sand layers at depths ranging from 2 to 14 feet below ground surface (bgs). These sand layers are confined above and below by generally unsaturated clay and silt layers. According to geologic cross section and Site boring interpretations, these sand layers appear to be discontinuous, and appear to pinch out or bifurcate

into multiple layers laterally over short distances. Geologic cross sections and a map showing cross section orientation are included as Attachment A.

According to a January 27, 1993 letter to Mr. Chuck Carmel (RM) from ACEH, groundwater in the central San Leandro region has been impacted by volatile organic compounds (VOCs); primarily PCE, TCE, and dichloroethylene. Significant levels of primarily gasoline and diesel hydrocarbons, toxic metals, and nitrates have also been detected in the regional groundwater.

## **1.4 Surface Water**

Based on the review of area topographic maps produced by the United States Geological Survey (USGS), three surface water bodies were located within a two-mile radius of the Site. San Lorenzo Creek (a channelized concrete aqueduct), Estudillo Canal, and Roberts Landing on the eastern shoreline of the San Francisco Bay are located approximately 700 feet south, 1,400 feet west, and 1¼ mile southwest of the Site, respectively.

## **2.0 FIELD ACTIVITIES**

Prior to initiating field activities, URS will obtain the necessary Alameda County Public Works (ACPW) soil boring permit, prepare a Site-specific Health and Safety Plan (HASP) for the proposed work, clear the Site for subsurface utilities, and complete the URS pre-drilling checklist. Utility clearance includes notifying Underground Service Alert (USA) a minimum of 48 hours prior to initiating the field investigation and securing the services of Cruz Brothers, a private utility locating company, to confirm the absence of underground utilities at the boring location.

The HASP is provided to all personnel and a copy of the HASP will be on-Site at all times. A safety tailgate meeting is conducted daily to review the hazards and the daily scope of work, including but not limited to drilling, utility clearance, and general safety.

In order to delineate deep contamination on the southeastern portion of the Site, URS proposes to conduct the following on-Site investigation:

### **2.1 Soil Boring and Hydropunch Advancement**

URS proposes to first advance a single soil boring and then advance a Hydropunch adjacent to the initial soil boring, located near the south corner on-Site. The boring and Hydropunch will be advanced to a minimum depth of 30 feet bgs and a maximum depth of approximately 50 feet bgs, based on lithology as determined by a Field Geologist. The rationale for this method is such that the lithology and moisture content of the soil encountered in the continuously cored boring will clearly define and indicate discrete lithological zones and water-bearing intervals to aid in collection of depth-discrete groundwater samples.

### **2.1.1 Groundwater Sampling and Analyses**

Groundwater samples will be collected from the boring, if possible, by Hydropunch technology. Depth-discrete groundwater samples will be collected using this technology, based on lithological interpretations by the Field Geologist during advancement of the adjacent boring. Groundwater recovered in this manner will be transferred into volatile organic analysis vials (VOAs), sealed immediately and labeled. Samples will be placed in an ice-filled cooler for preservation. Groundwater samples will be analyzed for BTEX using EPA Method 8260B.

### **2.1.2 Decontamination**

Drilling and sampling equipment will be decontaminated to prevent cross-contamination of the soil and groundwater samples. Equipment will be decontaminated before work began and after each use unless disposable equipment was used. Decontamination will be done in two phases, as described below:

The drill rig, down-hole drilling and sampling equipment, and other associated equipment will be decontaminated prior to arrival at the Site. Sampling equipment will be decontaminated during and after field activities by scrubbing with an Alconox ® and water solution in a five gallon bucket followed by two successive rinses with potable water in two five gallon buckets.

### **2.1.3 Waste Disposal**

Investigation-derived wastes, which include soil cuttings and decontamination water, will be temporarily stored on-Site in 55-gallon, DOT-approved 17H drums, pending characterization and disposal. URS will coordinate the transportation and disposal of the generated waste at a California regulated facility.

## **3.0 REPORTING AND PROPOSED SCHEDULE**

### **3.1 On-Site Investigation Report**

Upon completion of field activities and receipt of all laboratory analytical data, an *On-Site Investigation Report* that summarizes investigation activities and results will be submitted to ACEH.

### **3.2 Proposed Schedule**

Upon receiving written approval of this Work Plan from the ACEH, URS will proceed with the proposed work. URS will obtain all necessary permits to complete the proposed work. It is anticipated that an *On-Site Investigation Report* will be submitted to the ACEH within 60 days of receipt of all laboratory analytical results from drilling activities.



*Work Plan for On-Site Investigation*

March 3, 2006

Mr. Don Hwang

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We appreciate the opportunity to submit this *Work Plan for On-Site Investigation* to the ACEH and trust that this document meets with your approval. Please notify us of your approval as soon as practical. If you have any questions or concerns, feel free to contact us at (510) 893-3600.

Sincerely,

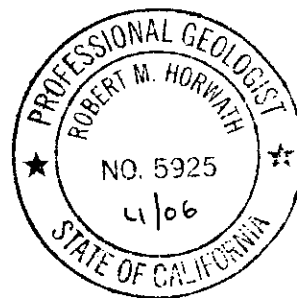
**URS CORPORATION**

A handwritten signature in cursive script, appearing to read "A. Kolekar".

Alok D. Kolekar, P.E.  
Project Manager

A handwritten signature in cursive script, appearing to read "R. Horwath".

Robert M. Horwath, P.G.  
Project Geologist



**Enclosures:**

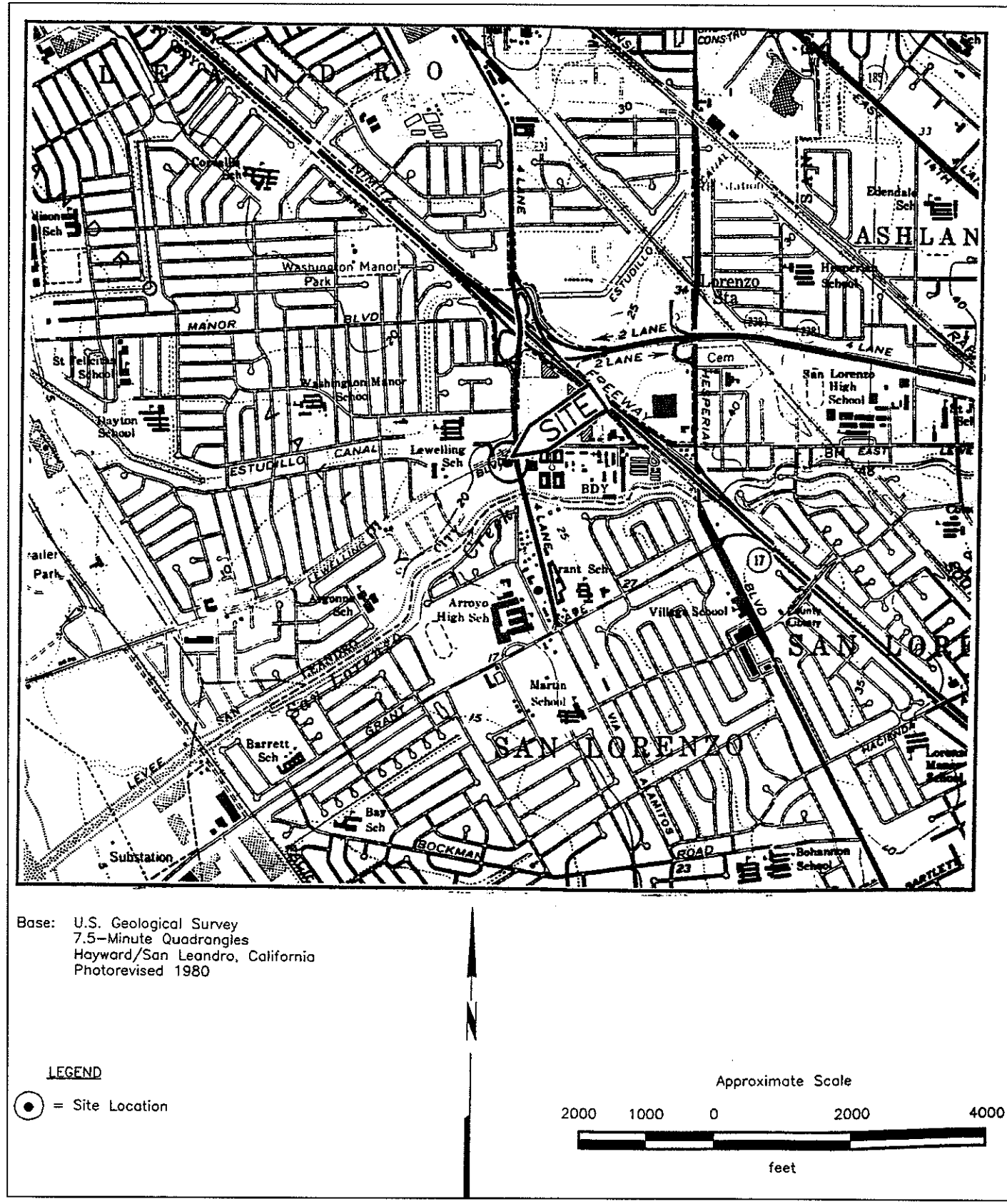
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|--------------|--|
| Figure 1     | Site Vicinity Map  |
| Figure 2     | Site Plan  |
| Attachment A | Generalized Site Plan (Plate 2) & Geologic Cross-Sections A-A', B-B', and C-C' (Plate 11) (RESNA, March 3, 1993) |

cc: Mr. Paul Supple, RM, electronic copy uploaded to ENFOS

**References:**

- ACEH, *Cal/EPA Regional Hydrogeology and Contamination Study, Central San Leandro*, January 27, 1993, letter from Chief Edgar B. Howell, III, to Chuck Carmel.
- CRWQCB, *Cleanup and Abatement Order (CAO) No. 92-147*, December 7, 1992, issued to RM and Mr. John Sullivan.
- Delta, *Hand Auger Boring Installation Report*, July 31, 2002.
- Helley, E. S., K. R. Lajoie, W. E. Spangle, and M. L. Blair, *Flatland Deposits of the San Francisco Bay Region, California*, United States Geological Survey (USGS) Professional Paper 943, 1979.
- Hickenbottom, Kelvin and Muir, Kenneth, *Geohydrology and Groundwater Quality Overview of the East Bay Plain Area, Alameda County, California*, Alameda County Flood Control and Water Conservation District, June 1988.
- RESNA, *Additional Offsite Subsurface Investigation Aquifer Pumping Test and Remedial Alternatives Feasibility Study*, August 5, 1993.
- URS, *Dispenser and Product Line Removal and Upgrade Soil Sampling Report*, October 9, 2003.

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Project No. 38487284  
ARCO Service Station #0601  
712 Lewelling Boulevard  
San Leandro, California

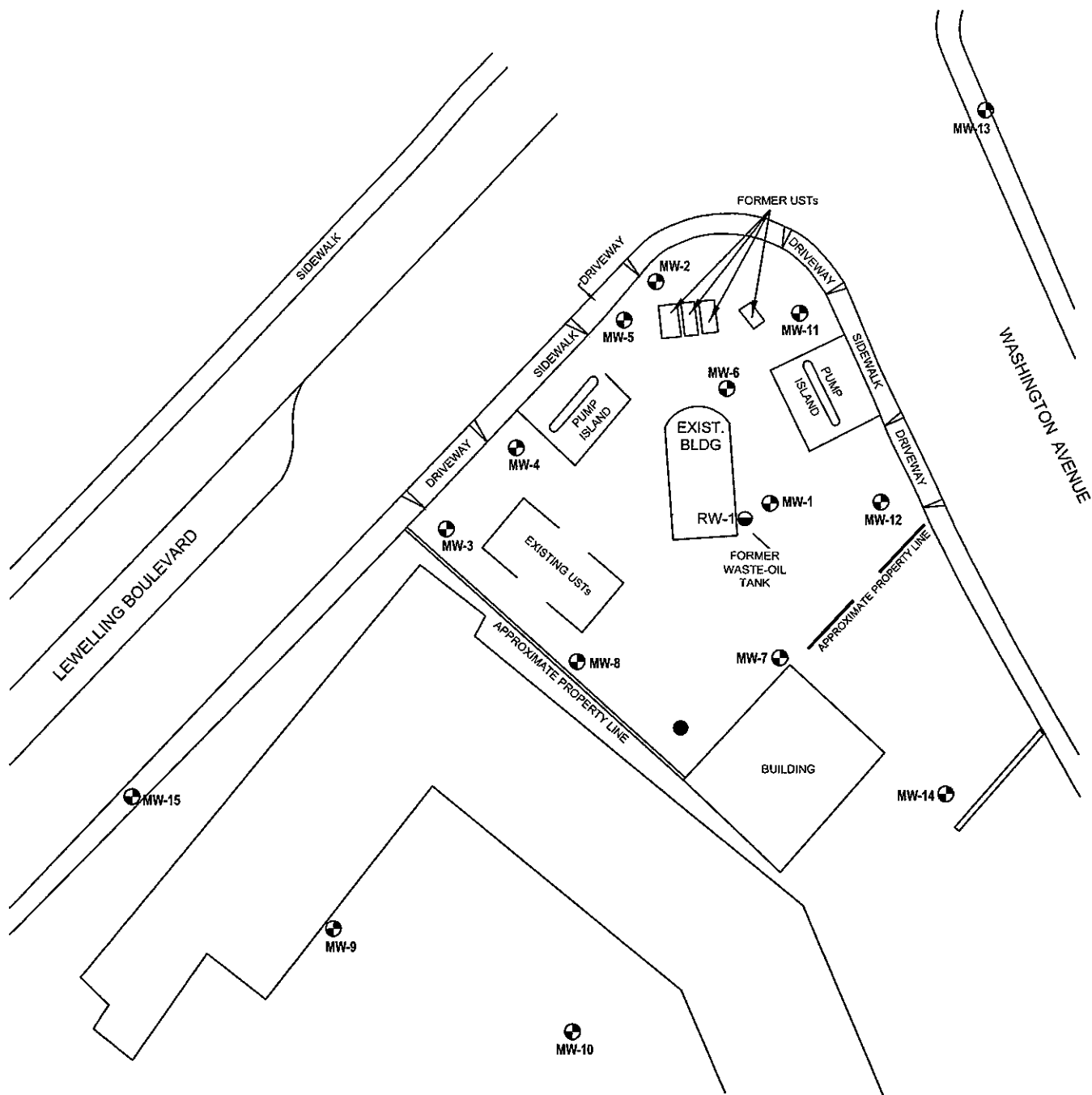
## SITE VICINITY MAP

FIGURE

1

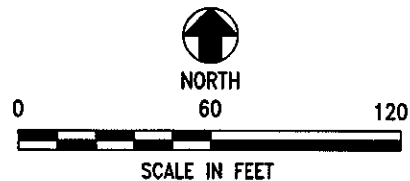


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**LEGEND:**

- GROUNDWATER MONITORING WELL
- SOIL VAPOR EXTRACTION WELL
- PROPOSED SOIL BORING / HYDROPUNCH LOCATION



NOTES: SITE MAP ADAPTED FROM DELTA ENVIRONMENTAL FIGURES.  
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

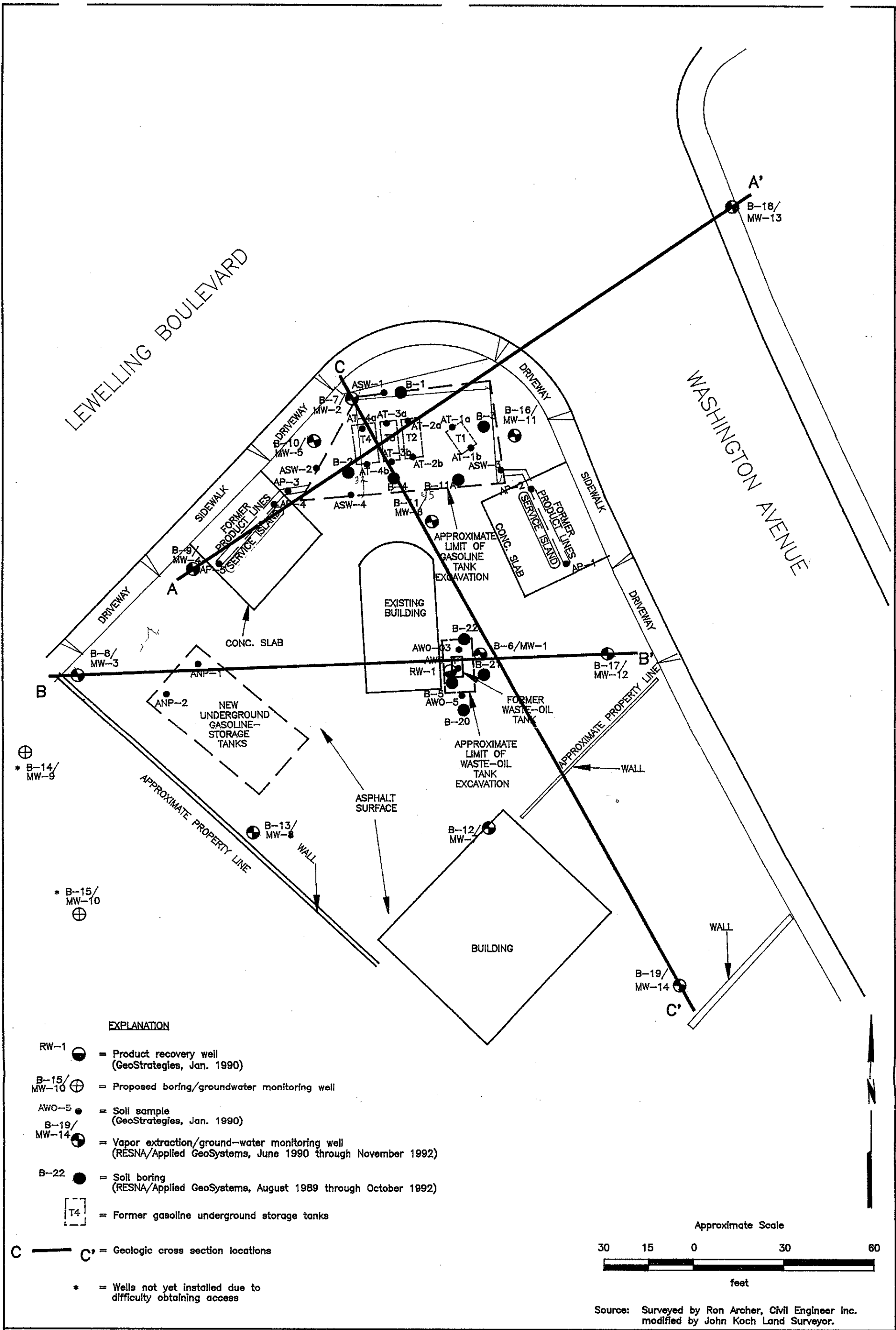
**URS**

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**SITE PLAN**

FIGURE  
**2**

**ATTACHMENT A**  
**Generalized Site Plan (Plate 2) &**  
**Geologic Cross-Sections A-A', B-B', and C-C' (Plate 11)**  
**(RESNA, March 3, 1993)**



**RESNA**  
Working to Restore Nature

PROJECT 69034.10

**GENERALIZED SITE PLAN**  
**ARCO Station 601**  
**712 Lewelling Boulevard**  
**San Leandro, California**

**PLATE**

**2**

